

Appendix G
Record of Performance Inspection and Brake Test—
On-Highway Type Mobile Equipment

General

Nonexempt on-highway trucks, truck tractor/trailer combinations, transmix trucks, dump trucks, buses, manhaul units, and rubber-tired excavators and other similar on-highway-type equipment must be performance inspected and tested by the contractor and/or owner in accordance with provisions contained herein and in the section entitled "Mobile and Stationary Mechanized Equipment." (Cranes will be inspected and tested in accordance with the section entitled "Hoisting Equipment, Piledrivers, and Conveyors.") The contractor/owner must conduct the inspections and tests prior to initial onsite use, annually thereafter, and when directed by Reclamation.

Initial and annual inspections and tests must be conducted in the presence of a Bureau of Reclamation representative and recorded using performance inspection criteria below and on the "Brake Performance Test Record" or a form that provides the same information. The form will then be signed and submitted to the appropriate Reclamation representative. Initial and periodic inspections and tests must be conducted onsite after the vehicle has been assembled or reassembled and prepared for operation. Manufacturer, contractor, or owner offsite inspections and tests must not be conducted until all appropriate performance inspection items are found to be available and in acceptable condition.

Performance Inspection

The performance inspection must, as a minimum, include the following features, components, accessories, and tests.

Item	Description	Available/ Acceptable
(1) Manufacturer's operating and maintenance manual	Manufacturer's operating and maintenance manuals or similar instructions must accompany equipment.	
(2) Maintenance and inspection records	Maintenance and inspection records must accompany the equipment. Unless the owner can produce such records, a complete inspection and maintenance program will be carried out and recorded.	

Item	Description	Available/ Acceptable
(3) Reverse signal alarm	An automatic reverse signal alarm is installed and functions when unit is placed in reverse gear or is moving in reverse. Requirements for this device may be waived if the equipment will not be operating in close proximity to personnel on foot or in congested areas. The alarm has been field tested.	
(4) Audible warning device	The unit is equipped with an audible warning device having the control lever within reach of the operator when seated in the operating position.	
(5) Lights	Equipment meets DOT requirements but never less than two headlights (one on each side), one red taillight on each side, one red stoplight on each side, and directional signal lights on each side both front and rear. Backup lights and floodlamps to illuminate working areas in restricted visibility situations.	
(6) Cabs	All equipment must have cabs with shatter-resistant glazing in all windows, heaters, defrosters, rearview mirrors, and windshield wipers. Windshield must be free of discoloration or damage that affects safe operation. There must be at least one window on each side of driver compartment. Engine exhaust gases are piped outside and/or discharged away from operation.	
(7) Towing	Towing devices used on any combination of vehicles must be structurally adequate for the load imposed and securely and properly mounted. A locking device must be provided on fifth-wheel and tow bar systems to prevent accidental separation of units. Safety chains must be provided for towed units up to 3,000 pounds gross weight, and automatic break away stopping systems for towed units over 3,000 pounds gross weight.	

Item	Description	Available/ Acceptable
(8) Fenders and mudflaps	All equipment with maximum speed exceeding 15 mph and traveling on unsurfaced roads are provided with fenders and splash and stone throw protection. Haul trucks must conform to these requirements regardless of road surface. Trucks with beds or other structural members extending beyond wheel width and in a manner that prevents or eliminates danger from wheel thrown objects meets fender requirements. Reclamation may exempt fenders when not available from manufacturer.	
(9) Seatbelts	Seatbelts and anchorages meeting DOT requirements are installed for the operator and all passengers.	
(10) Emergency equipment	Vehicles exceeding 10,000 pound gross weight, buses, and manhaul units, are equipped with one 12-inch square red flag, three reflective markers, wheel chocks for each unit, one 2-A:40-B:C dry chemical fire extinguisher. When transporting flammable or explosive cargo, two 2A 40 B:C extinguishers are required.	
(11) Access	Access to cab or other work location on the equipment has sufficient steps and handholds to provide a three-point contact system for employees ascending or descending from work or operator positions. The first step is no more than 24 inches from ground level, or no more than 20 inches, unless means are provided for two handholds.	
(12) Fill openings	Fill hatches on water tank trucks or trailers are guarded by either reducing the size of the opening to a maximum of 8 inches in diameter or by attaching a heavy metal grill over the opening.	
(13) Dump trucks	Dump trucks of all descriptions are equipped with: (1) latches or other means for preventing accidental movement of trip handles or dump body operating levers. (2) A permanent mounted manual device to prevent accidental lowering of dump body or bed. (3) Cab protection if loaded or unloaded by crane, loader, or shovel. Trucks without this protection are equipped with a readily visible sign instructing the operator to leave the cab during loading or unloading operations.	

Item	Description	Available/ Acceptable
(14) End-dump trailers designed for on-highway hauling and used in off-road hauling	End-dump trailers are equipped with a tipover protection device with continuous monitoring display of the trailer box position at the equipment operator station to provide the operator with a quick and easily read indicator that shows safe, marginal, and unsafe degrees of lateral tilt. Additional requirements are: (1) an indicating audible alarm that signals an unsafe degree of tilt (alarm should have an on-off switch so it can be switched off when not dumping); (2) sufficient indicator lighting to be visible for night operations; and (3) hookup flexibility for easy interchange between tractors and trailers.	
(15) Transmix trucks lockout device	Transmix trucks are equipped with a lockout device that prevents use of exterior controls until interior gear arrangement and brakes are in proper position. Providing equal protection acceptable to Reclamation meets this requirement.	
(16) Braking systems	<p>A bus, truck, tractor, or combination of vehicles or similar type equipment have the following braking systems conforming to these requirements, the RSHS, and DOT requirements.</p> <ol style="list-style-type: none"> 1. A service braking system. 2. A parking brake system. 3. A secondary brake system. (Equipment manufactured prior to July 1967 may be exempted from this requirement unless the system was available from the manufacturer at date of manufacture, is presently available from the manufacturer, or was required by the standard in force at time of manufacture.) <p>The above braking systems have been installed, inspected, and tested and found to be in conformance with applicable requirements contained in the referenced standards and on the Brake Performance Test Record form. Further, the inspection and test results have been recorded on the aforementioned form.</p>	

Brake Performance Test Record

Part I - General

Nonexempt on-highway type trucks, truck-tractor/ combinations, transmix trucks, dump trucks, excavators, and similar on-highway type equipment must have braking systems conforming to Reclamation Safety and Health Standards and performance inspection criteria. The equipment must incorporate the features, components, accessories, and performance capabilities required under part II and part III.

Equipment found to meet the requirements of this form and RSHS section entitled, "Mobile and Stationary Mechanized Equipment" must be brake tested in accordance with the requirements, methods, and procedures described in part III and the RSHS. Results must be recorded in parts V, VI, and VII of this form. The completed form must be signed in part VIII and submitted to Reclamation.

Equipment failing brake test(s) must not be placed into service until the braking system has been repaired and satisfactorily tested.

Part II - Braking Systems Features, Components, Accessories, and Performance Capabilities

A. Service Braking System

1. All equipment must have an effective service braking system. The service brake system must have the capability of stopping and holding the equipment when loaded to the gross vehicle weight (GVW) on the maximum slope of intended travel. This requirement applies to both forward and reverse directions. The braking system also must be capable of bringing the equipment to a stop within the distances and under the conditions specified in part III.
2. The service brake system is the type that is foot applied or released by the operator while sitting in the operating position.
3. Equipment must have brakes on all wheels.

B. Secondary Braking System

1. All equipment, unless exempted, has a secondary brake system.

2. The system is capable of being applied manually by a person seated in the operating position. The system is arranged so it cannot be released from the operator's seat after an application, unless immediate reapplication can be made from the operator position.
3. The secondary brake system can be separate from the service brake system or an interconnected system. If an interconnected system is used, it must be designed, constructed, and maintained so failure of any part of the operating mechanism of one or more systems (except service brake activation pedal or valve in a dual hydraulic system) does not reduce the effectiveness of the vehicle's stopping capability below the secondary brake stopping performance requirements.
4. The system may, in addition to manual activation, be activated automatically. If equipped with an automatic feature dependent upon pressure or vacuum forces, the automatic application will not occur until a warning device is activated.
5. The system must be capable of bringing the equipment to a stop within the distances and under the condition specified in part III.

C. Parking Brake System

1. The equipment has an effective parking brake system or combination maxi-brake parking brake system.
2. The parking brake is capable of being applied by a person seated in the operator's seat.
3. The parking brake may be applied by the driver's muscular effort, or by spring action, or by any other energy, provided that energy source is isolated from other sources.
4. The parking brake system is held in the applied position by energy other than fluid pressure, air pressure, vacuum, or electric energy. The system must be such that it cannot be released unless adequate energy is available upon release to make further application with the required effectiveness.
5. The braking system is capable of holding the equipment stationary under the conditions specified in part III.

D. Features, Components, Accessories

1. Braking systems utilizing air, stored hydraulic, or vacuum energy must be equipped with a gage that indicates the pressure or vacuum available for braking.
2. Braking systems utilizing air, stored hydraulic, or vacuum energy must be equipped with a readily visible or audible low energy, continuous warning device at the operator's

position. The device will activate: (a) before air or hydraulic pressure drops below 50 percent of maximum energy level; (b) when vacuum in the supply reservoir is less than 8 inches Hg, (c) before or upon application of dual hydraulic type systems. Gages indicating pressure or vacuum are not acceptable for meeting this requirement.

3. Braking systems may use common components (see secondary brake system requirements).

4. Braking systems utilizing air, stored hydraulic pressure, or vacuum for braking must be equipped with reserve capacity or a reservoir of sufficient capacity to insure a full service brake application with the engine stopped without depleting the air or hydraulic pressure or vacuum below 70 percent of operating pressure or vacuum.

Part III - Brake Testing Methods and Procedures

All equipment referenced in this appendix and section entitled "Mobile and Stationary Mechanized Equipment," unless exempted, must undergo the braking performance tests required. Such tests must be conducted in accordance with the following methods and/or procedures.

A. General

1. All tests must be conducted with applicable braking systems at full charge.
2. Units must be tested at maximum loading.
3. All dynamic stopping tests must be conducted from a 20-mile-per-hour speed.
4. Stopping tests must be conducted with the transmission in the gear range commensurate with the 20-mile-per-hour testing speed. The power train may be disengaged prior to completing the stop.
5. Auxiliary retarders must not be used in the test, unless the retarders are simultaneously activated by the applicable brake control system.
6. Stopping distances must be measured from the point at which the brake control is applied to the point at which the machine stops.
7. Means must be provided to determine weight of the equipment and stopping distance with an accuracy of plus or minus 2 percent and test speed with an accuracy of plus or minus 5 percent.

B. Service and Secondary Braking System

1. Service and secondary dynamic braking tests must be conducted on a level (less than 1-percent grade in direction of travel and 3-percent grade at right angles to travel) clean, swept dry surfaces at least 18 feet 0 inches wide. The course length must be sufficient for accelerating from 0 to 20 miles per hour and providing a stopping distance equal to 1-1/2 times that shown for the emergency braking system. Static service brake holding tests shall be conducted on maximum grade of intended travel.
2. Service and secondary braking system must have the following stopping capabilities when traveling at 20 miles per hour:

<u>Equipment</u>	<u>Service brake</u>	<u>Secondary brake</u>
Light trucks and buses to 10,000 pounds	25	85
Trucks and buses over 10,000 pounds	35	85
Combination of vehicles	45	85

The units must not deviate from a 12-foot-wide lane prior to or during tests. No wheels shall drag during the service braking test.

3. Units utilizing a dual system for meeting emergency brake system requirements must have each system independently tested (i.e., each system of a dual hydraulic system can be tested independently by freely releasing the fluid to the atmosphere at the point of simulated failure in the dormant system). Each system must be capable of stopping the machine in the distance shown under secondary brakes.

C. Parking Brake System

1. Parking brake system tests must be conducted on a dry, swept, 15-percent grade surface. The tests must be conducted with the unit facing both up and down the slope. Once the unit is in place and the parking brake set, all other holding devices must be released and the transmission placed in the neutral position. Any energy assist sources (air, vacuum, hydraulic) will be depleted. The unit must remain in this condition without movement for 5 minutes.

D. Energy Recovery Test

1. **Air and air assist systems.** With engine off and brakes applied listen for sounds or not any other evidence of air leakage. If no leakage is found, make a full-pressure application and hold for 1 minute. Pressure must not drop below 70 percent of operation pressure. Again, check for sounds or leakage of air.
2. **Vacuum and vacuum assist systems.** Turn engine off and depress the brake pedal with a light pressure for 10 seconds, and then press hard for 10 seconds. Determine if brake pedal moves or there is noise or other evidence of leaking system. Vacuum loss should not exceed 70 percent of normal operating level, nor should the brake pedal come within 1 inch of floor or travel stop.
3. **Hydraulic or stored hydraulic pressure systems.** Follow the procedure for vacuum system for straight hydraulic system or air system procedures for stored hydraulic pressure system.

BRAKE PERFORMANCE TEST RECORD		
Non-Highway Type Trucks 10,000 Pounds GVW and Over, Truck-Tractor/Trailer Combinations, Transmix Trucks, Dump Trucks, Excavators, and Similar Type Equipment		
General Information		
Date of Test	Specification No.	
Contractor		Subcontractor
Description (Make and Model)		
Serial No., or Contractor's No.		Year of Manufacture
Service Brake System Test		
Type (air, vacuum, mechanical, hydraulic, comb.)	No. of axles with Brakes	
Condition of Test Course (Surface and Grade)		
Weight of Vehicle (Manufacturer's Gross Vehicle Weight Rating- GVWR)		
Pressure or Vacuum Maintained During Braking <input type="checkbox"/> Satisfactory <input type="checkbox"/> Deficient		
Pressure or Vacuum Recovery		
Warning Device for Stored Energy Systems <input type="checkbox"/> Satisfactory <input type="checkbox"/> Deficient		
Stopping Distance (Satisfactory or Deficient in Comparison with Appropriate Table) Feet Traveled _____ Feet Traveled _____ 1 st Trial Satisfactory <input type="checkbox"/> Deficient <input type="checkbox"/> 2 nd Trial Satisfactory <input type="checkbox"/> Deficient <input type="checkbox"/>		
Holding Performance on Grade Satisfactory <input type="checkbox"/> Deficient <input type="checkbox"/>		
Emergency Stopping System		
Type	Manual Only	Manual/Automatic
Stopping Distance (Satisfactory or Deficient in Comparison with Appropriate Table) Feet Traveled _____ Satisfactory <input type="checkbox"/> Deficient <input type="checkbox"/>		
Parking System Tests		
Holds on 15% Grade	Forward <input type="checkbox"/>	Reverse <input type="checkbox"/> Remains Applied for 5 Minutes Forward <input type="checkbox"/> Reverse <input type="checkbox"/>
Signatures		
Tested by (Contractor Representative): Signature: Title:		Witnessed by (Government Rep): Signature: Title: